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ABSTRACT

To help elementary school teachers decide whether writing is beneficial to their students' comprehension, and if it is, which activities are the most effective, a study examined research which dealt with whether the writing performed by elementary school students helps them to comprehend better their own and others' written works. Included are 33 annotations in three areas: (1) studies showing the correlations between students' abilities to write and to comprehend; (2) studies on how writing exercises undertaken before or after reading another author's text affects children's comprehension; and (3) studies about the effects that written works created by the students themselves have on their comprehension. Findings conclude that examination of these studies proves that elementary school students' writing abilities and the amount of writing they performed were highly correlated with their reading comprehension performances; studies on mapping showed it to be significantly more beneficial to comprehension than other study skills or lessons from basal readers; research conducted on the sentence-combining method demonstrated that this technique was superior in the improvement of the comprehension of elementary school students over other methods of instruction; both summarizing and outlining proved to be beneficial to elementary school students' comprehension; and students improved their comprehension when they wrote their own stories. (A glossary is included, and 41 references are attached.) (MS)

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The Effects of Writing
on Elementary School Students'
Reading Comprehension

by

Lori L. Heise

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
Statement of the Problem	1
Organization of the Study	2
Limitations of the Study	2
Glossary	4
ANNOTATIONS	6
The Relationships Between Reading Comprehension and Writing	6
Correlation Studies	6
Factors of Age and Ability	7
Writing Before and After Reading	9
Mapping	9
Sentence-Combining	11
Cloze Procedure	14
Summarizing and Outlining	16
Student-Generated Writing	19
Modeling of Others' Writing	19
Schemata and Decoding Factors	20
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	22
Summary	22
Conclusion	29
Recommendations	32
BIBLIOGRAPHY	33
STUDENT QUALIFICATIONS	37

INTRODUCTION

For the past ten to fifteen years, school children have not been able to successfully write answers to inferential comprehension questions or a summary paragraph about a passage they had read. This situation has taken place because children have not been given enough time to write in the classroom. However, a change is taking place, and more writing is being done in classrooms (Tierney, Readence, and Dishner). Some researchers believe that the purpose of both reading and writing is to understand and develop meaning (Clay). Therefore, these two processes should be taught together (Smith; Murray; Shuy). Others wonder if oral discussion is not enough to develop sufficient comprehension (Gould, Haas, and Marino). Because there is a large movement towards teaching reading and writing together (Shanahan), teachers need to know if writing really is an effective way to teach children to understand the materials they read. If it is true that writing improves children's comprehension, teachers should know which writing methods are most effective. This paper hopes to help elementary school teachers decide if writing is beneficial to their students' comprehension, and if it is, which activities are the most effective.

STATEMENT OF THE PROBLEM

The purpose of this paper is to find evidence to explain if the writing performed by elementary school students helps them to comprehend better their own and others' written works.

ORGANIZATION OF THE STUDY

This paper is divided into three parts. The first part will report on studies done showing the correlations between students' abilities to write and to comprehend. The second section will discuss how writing exercises done before or after reading another author's text affects children's comprehension. The third portion of the paper will include studies about the effects that written works created by the students themselves have on their comprehension.

LIMITATIONS OF THE STUDY

Although the writing techniques reviewed in this paper appeared to have a positive influence on elementary school students' reading comprehension, the following examples were found as limitations of the study.

1. Some authors questioned if oral discussion could have produced the same results as writing (Sampson, Valmont, and Van Allen; Gould, Haas, and Marino).
2. The types of tests given at the conclusion of some of the studies could have affected the results because of the types of thinking they measured (Neville and Searls; Straw and Schreiner; Amuchie).
3. More correlation studies should be performed to confirm that reading comprehension and writing are related only in upper elementary school students (Shanahan).
4. It was found that mapping may only be effective to comprehension when the students are actually using the technique and for passages that are organized in a certain order (Berkowitz).

More long-term research should be performed on mapping since the newness of the activity may have caused the increase in comprehension (Sinatra, Stahl-Gemake, and Berg).

5. Although summarizing and outlining seemed to benefit comprehension, it was suggested that further research be conducted to confirm these results (Haynes and Fillmer; Amuchie; Bromley).

6. The language experience approach has not been researched much for its effects on comprehension (Hall).

7. More research needs to be done to discover if students actually comprehend their own stories better than others' stories, or if they simply memorize their own stories (Allen).

GLOSSARY

- cloze procedure - "a procedure used to estimate readability of printed material and to evaluate and improve reading comprehension; based on the gestalt concept of closure and involving a cloze test composed of reading selections from which words have been deleted; completion of the test requires that the testee fill the blanks left by the deletions." (Good, p. 108)
- comprehension - "the act of understanding the meaning of printed or spoken language as contrasted with the ability to perceive and pronounce words without reference to their meaning." (Good, p. 123)
- directed reading activity - "a reading activity carried on under the guidance of the teacher, including the reading of specific references, the solving of problems, and the answering of questions." (Good, p. 10)
- generative model of learning - "reading comprehension is facilitated when, during encoding, learners use their memories of events and experience to construct meanings for the text." (Doctorow, p. 109)
- kernel sentence - "a basic pattern sentence from which other sentence forms may be developed through transformational procedures such as changes in word order, tense, or expansion." (Good, p. 528)
- language experience approach - "an integrated language arts program which builds upon the interrelationship between and among reading and the related language arts of writing, speaking, and listening; use is made of individual and group compositions as reading materials in the language experience approach to the teaching of reading." (Good, p. 329)
- map (or web) - "a graphic arrangement showing the major ideas and relationships in text or among word meanings. The map consists of "nodes" (drawn in circles, rectangles, or squares) containing key words or phrases, with connecting links (lines or arrows drawn between the nodes)....maps can be constructed with students before, during, or after reading." (Sinatra, pp. 22, 23)
- outline - "a sequential enumeration in condensed form of the main ideas and supporting details of material read or of material to be used in writing or speaking." (Good, p. 404)
- paraphrase - "a restatement of a text, passage, or work giving the meaning in another form." (Woolf, p. 825)
- precis - "a summary of digest (not, however, in outline form) of the most important parts of a work." (Good, p. 432)

readability index - "a composite score designed to indicate the level of difficulty, usually measured in terms of school grades, of a piece of reading material." (Good, p. 296)

retrieval clues - "the words, sentences, and paragraphs in a given context...that stimulate semantic processing of information stored in memory." (Doctorow, p. 109)

schemata or schema theory - "explains the essence of comprehension by proposing that what is understood during reading or listening is linked in some conceptual way with what existed in the mind of the learner beforehand." (Sinatra, p. 23)

sentence-combining - "as an instructional technique involves combining two or more kernel sentences into a longer, more complex sentence containing such structures as adjective and adverbial modifiers, phrases, and dependent clauses." (Neville, p. 37)

standardized test - "a test for which content has been selected and checked empirically for which norms have been established for which uniform methods of administering and scoring have been developed, and which may be scored with a relatively high degree of objectivity." (Good, p. 603)

structured overview - "to help readers understand the organization and interrelationships of the information to be learned. The structured overview provides a hierarchical structure which readers can use to organize ideas and assimilate information more easily. In addition, the structured overview establishes relationships between new information and a reader's previous knowledge." (Lewitz, p. 99)

summarizing - "an oral, written, or mental condensation, as of material read." (Good, p. 570)

syntax - "the area of grammatical study dealing with sentence structure and word relations as established by usage." (Good, p. 579)

writing - "the graphic representation of a language that follows some systematic order; pictures or graphic symbols are not considered writing unless they form part of a system that can be grasped by any reader familiar with the system." (Good, p. 652)

ANNOTATIONS

THE RELATIONSHIPS BETWEEN
READING COMPREHENSION AND WRITING

CORRELATION STUDIES

Heil, Helen F. The Development of Selected Language Variables in Two Modes of Writing and Their Relationship to Reading Comprehension in the Primary Grades. Ann Arbor, MI: University Microfilms International, 1976.

Sixty-three first graders, 55 second graders, and 70 third graders from an upper-middle class neighborhood in New York were tested to find if their ability to write was correlated with their ability to comprehend reading material. It was found that writing ability was a good indication of reading comprehension, especially in the second-grade students.

The author suggested that a well-planned writing program during these years might be very beneficial to students' reading comprehension performance. She also found that the students' ability to combine sentences was closely related to their comprehension ability, and she stated that practice in sentence-combining might make students more aware of the structure of the material they are reading.

Evanechko, Peter, Lloyd Ollila, and Robert Armstrong. "An Investigation of the Relationships Between Children's Performance in Written Language and Their Reading Ability." Research in the Teaching of English 8 (Winter 1974): 315-326.

This study examined 118 middle-class sixth-grade students from the same school. A writing sample was taken from and a reading test administered to each student. As a whole, the scores from these tests showed a high correlation between all reading and writing components including comprehension. However, scores varied significantly for the individual students.

The authors felt that overall, the scores showed that the processes of reading and writing have many skills in common, and that the skills practiced in one area should benefit the skills on the other area. The authors noted that when the students increased their understanding of syntax, they also improved their reading ability.

Hughes, Theone. "What the British Tell the U.S. about Writing and Reading." Paper presented at the Annual Great Lakes Regional Conference of the International Reading Association. Cincinnati, OH, ED 175 020, Oct. 1978.

Hughes studied 516 students from classrooms in Kalamazoo, Michigan and Nottingham, England. The children were of ages 8 through 11. Hughes wanted to find out if the amount of time that British and American students wrote in the classroom had an impact on the students' reading performance. It was found that British children wrote between 8 to 14 hours per week. In the United States, the students wrote only $\frac{1}{2}$ hour per month to $2\frac{1}{2}$ hours per week. The British children scored significantly higher in comprehension on standardized tests than did the children from the United States. There was a high correlation between the students' knowledge of syntax scores or writing scores and their reading comprehension scores. These findings were especially interesting because the British children do not receive formal reading instruction from basal readers.

The author stated that in the United States, we should give consideration to including writing more often in our curriculum.

FACTORS OF AGE AND ABILITY

Shanahan, Timothy. "Nature of the Reading-Writing Relation: An Exploratory Multivariate Analysis." Journal of Educational Psychology 76 (June 1984): 466-477.

Shanahan wanted to examine the relationships between learning to read and learning to write. His study consisted of 12 second-grade classes. Each child took four reading tests and gave two writing samples. A spelling test was also administered. The scores of the tests were compared to find correlations among different parts of reading, writing, and spelling. The researcher discovered that the ability to decode words with the use of phonics had the highest correlation with the ability to spell correctly in second graders. However, the scores of the fifth graders showed the highest correlation between their ability to use higher level vocabulary and organizational structure when writing, with their ability to comprehend when reading.

Shanahan concluded that the way reading and writing relate changes from when children are young and beginning to read to when they become older, more experienced readers. He suggested more research be done to verify his study. However, if the scores were accurate, he recommends that the reading and writing skills that were most closely related be taught together to achieve the most learning.

Juel, Connie, Priscilla L. Griffith, and Philip B. Gough.

"Acquisition of Literacy: A Longitudinal Study of Children in First and Second Grade." Journal of Educational Psychology 78 (August 1986): 243-255.

During this two-year study, the authors examined 129 lower middle-class first graders. The number of students dropped to 80 by the end of the second grade because of children who moved or were held back in the first grade. The children were tested with many different tests to find correlations that existed between spelling, word recognition, intelligence, phonics knowledge, reading comprehension, and writing. The results showed a low correlation score between reading comprehension and writing not only of the children as first graders, but also as second graders. However, there was a high correlation in both grades between the children's abilities in word recognition and spelling.

The authors noted that reading comprehension and writing are not highly related in the early grades because the thinking process used to write is different from the thinking process used to read at that age.

Schewe, Annette, Victor Froese. "Relating Reading and Writing Via Comprehension, Quality, and Structure." Research in Literacy: Merging Perspectives, 36th Yearbook of the National Reading Conference. Rochester, NY: National Reading Conference, Inc., 1987. 273-279.

Schewe and Froese studied 36 students in the fourth grade to discover if there was a relationship between the students' reading comprehension and their writing ability. Each student read two stories, restated them to a tester, and answered questions about the stories. They also each wrote three stories about three different pictures. From these measurements, the authors found a significant relationship between the students' reading comprehension and writing ability.

The authors noted that all of the students were able to comprehend. However, the low-ability writers had difficulty using all of their story schema when writing.

Chall, Jeanne S. and Vicki A. Jacobs. "Writing and Reading in the Elementary Grades: Developmental Trends Among Low SES Children." Language Arts 60 (May 1983): 617-626.

The researchers examined 30 students of low socioeconomic status in the second, fourth, and sixth grades. A reading test was given to each student which broke down scores into the different components of reading. Writing samples were taken for both narrative and expository writing. The students' reading scores were closely related to their writing scores. The scores of the children in the upper grades showed that as they grew older, they fell further behind their grade levels.

Since the study proved writing to be related to reading, the authors felt that by having these students write more, they would progress in reading and not fall further behind grade level as they grew older.

WRITING BEFORE AND AFTER READING

MAPPING

Berkowitz, Sandra J. "Effects of Instruction in Text Organization on Sixth-Grade Students' Memory for Expository Reading." Reading Research Quarterly 21 (Spring 1986): 161-178.

This study compared four types of study skills: map-study, map-construction, question and answer, and rereading. Ninety-nine sixth graders took part in the experiment. The students were split into four groups, and each group learned a different study technique. Each group was instructed in their technique for one 45-minute period per week for six weeks. The map-construction group scored significantly higher than the other groups on immediate and delayed recall tests in which they used the mapping exercise. On a test in which they did not apply the mapping technique, the groups scored equally well.

The author stated that the results showed when students understand the structure of a text and actively reconstruct the text, they will comprehend and remember it better. The author noted that the map-construction students comprehended some passages on the tests better than others. Berkowitz concluded by stating that some passages are better organized for map-construction than other passages, and that the high-ability readers scored better than the low-ability readers when using map-construction.

Reutzel, D. Ray. "Story Maps Improve Comprehension." The Reading Teacher 38 (January 1985): 400-404.

Reutzel divided 102 middle class fifth grade students into two groups. Both groups read two basal reader passages, one expository and one narrative. One of the groups studied maps of the story prior to reading and then wrote their own maps of the stories. This group had a much higher recall of the stories than the group that orally discussed the stories with a directed reading lesson.

The author expressed that story maps were beneficial because they made the students aware of the structure of the stories. This awareness helped the students to organize events in the stories and the relationships between the events in visual pictures. He also said that maps helped the students to become actively involved in thinking about the stories and to relate their prior knowledge to new knowledge gained from the stories.

Sinatra, Richard C., Josephine Stahl-Gemake, and David N. Berg.
 "Improving Reading comprehension of Disabled Readers Through
 Semantic Mapping." The Reading Teacher 38 (Oct. 1984): 22-29.

The authors compared three different mapping strategies with a typical directed reading lesson to guide silent reading from a basal reader. Twenty-seven reading disabled children, 21 boys and 6 girls, from grades two through eight were taught five lessons using the mapping techniques and five lessons using directed silent reading. Nineteen of the 27 students scored higher on comprehension questions after performing the mapping activities as opposed to the basal approach.

The authors concluded that the improvement was due to the visual exposure to the main parts of the stories and how they related to each other. They did note, however, that part of the results may have been due to the newness of the activities. The students' responses were very positive to the technique.

Prater, Doris L. and C. Ann Terry. "The Effects of a Composing Model on Fifth Grade Students' Reading Comprehension." Paper presented at the Annual Meeting of the American Educational Research Association. Chicago, IL, ED 254 829, April, 1985.

In their investigation, Prater and Terry studied the use of mapping both before and after reading passages. Two average ability fifth-grade classes were used in the study. Both groups read the same six basal reader stories. To learn the new concepts of the stories, the experimental group mapped their knowledge of the topic prior to reading, mapped the new ideas they learned after reading, and wrote summaries about the stories. The control group was taught the basal stories in a traditional manner. The results showed that the experimental group was much more successful in answering comprehension questions than the control group.

The authors felt that mapping was beneficial to the students' comprehension because it helped the students to associate information with which they were already familiar to information that was new to them. The authors also noted that the students and teachers enjoyed performing the mapping activities.

Bayne, Mina. "A Study of the Use of the Semantic Webbing Technique to Improve Reading Comprehension of Third and Fourth Graders." Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association. Laramie, WY ED 265 490, Oct. 1984.

Bayne examined 25 third graders and 24 fourth graders to see if there was a difference in the effect a basal reading program, as compared to semantic webbing, would have on reading comprehension. Three groups of the same ability levels were taught to comprehend by a basal technique, and the other three groups wrote answers to questions about the stories and performed semantic webbing on the chalkboard as a group. All of the groups were instructed for 20 to 30 minutes, three times per week, for six weeks. On a standardized test, a cloze test, and a short passage with questions test, there was no significant difference between the two groups' comprehension scores.

Bayne believed that since both techniques were of equal value to comprehension, both techniques should be taught. She stated that further research should be done with larger numbers of students.

SENTENCE-COMBINING

Froese, Victor and Susan Kurushima. "The Effects of Sentence-Expansion Practice on the Reading Comprehension and Writing Ability of Third-Graders." Reading Research: Studies and Applications, 28th Yearbook of the National Reading Conference. Clemson, SC: National Reading Conference, Inc., 1979. 95-99.

Ninety-five third graders from two suburban schools in the same school district took part in this study. The students were divided into four groups. One group performed sentence-expansion exercises, one group participated in a directed reading program, one group chose from many different activities, and one group performed their regular classroom activities. Each group performed these exercises during eight half-hour time slots. Three cloze tests were given three weeks after the exercises were completed and showed that the sentence-expansion group had significantly improved their reading comprehension over the other groups on passages that were syntactically difficult.

McAfee, Deurelle Clark. "Effect of Sentence-Combining Instruction on the Reading and Writing Achievement of Fifth-Grade Children in a Suburban School District." DAI 42 (1981): 156A. Texas Woman's University.

In this investigation, the author wanted to examine if sentence-combining exercises would have an effect on students' reading comprehension. Two groups of fifth-grade students were studied. Each group contained 25 students. As a pretest, each student performed a free-writing exercise for 30 minutes. For six weeks, the experimental group practiced sentence-combining exercises for 45 minutes each day. This group also wrote stories and paragraphs. For the same amount of time, the control group performed the usual language arts activities. On a standardized reading test, the experimental group scored significantly higher on comprehension improvement than did the control group.

Neville, Donald D. and Evelyn F. Searls. "The Effects of Sentence-Combining and Kernel Identification Training on the Syntactic Component of Reading." Research in the Teaching of English 19 (Feb. 1985): 37-61.

Sixth-grade students from three Florida urban schools were divided into two groups. Over a ten week period, one group was given instruction in eight sentence-combining activities, seven kernel-identification activities, and eight cloze activities. The other group was taught only the eight cloze activities. On post and delayed-post cloze comprehension test, the first group scored significantly higher than the second group. However, on two parts of a standardized comprehension test, there were no significant differences between the groups.

The authors said that the areas of comprehension measured on the two different tests were different and could have caused the differences in the results. Because three types of exercises were taught, it was not certain which exercises, if any, affected the outcomes. The authors thought that the results could have been affected by the extra exposure that the first group had to the material on which they were tested.

Straw, Stanley B. and Robert Schreiner. "The Effect of Sentence Manipulation on Subsequent Measures of Reading and Listening Comprehension." Reading Research Quarterly 17 (May 1982): 339-352.

Six groups were created from 124 fourth-grade middle class students. Two groups were taught to write by a sentence-combining approach, two groups were taught by sentence reduction, and the other two groups were instructed to write by using their language books. All of the groups were taught for thirty minutes each day for 25 consecutive days. The sentence-combining groups scored significantly higher on a standardized listening comprehension test than the sentence-reduction or language book groups. The first four groups scored significantly higher than the language book groups on a cloze comprehension test.

The researchers stated that sentence-combining did appear to have a positive effect on the children's comprehension. They felt that the first two groups scored well on the cloze test because it measured the type of thinking they practiced during the exercises. They added that all three writing methods were effective for reading comprehension improvement. They recommended that further studies be done to confirm these results.

Melvin, Mary P. "The Effects of Sentence-Combining Instruction on Syntactic Maturity, Reading Achievement, and Language Arts Skills Achievement." Microfilm. ED 191 007, July 1980.

In this study, two groups made up of 80 students each were examined. Twenty students were randomly chosen from each of four different age groups, ages 8, 9, 10, and 11, to make up each group. The experimental group took part in 31 different sessions of sentence-combining exercises over four months. A writing assignment was usually included in each session. The control group was taught with a traditional skills-based method of instruction over the four months. There was no significant difference found between the two groups on standardized reading and language tests and a syntactic maturity test.

Melvin deduced that the sentence-combining exercises were as beneficial to comprehension as a skills approach and could be used as a supplement to a regular skills program.

CLOZE PROCEDURE

McGee, Lea M. "Effects of the Cloze Procedure on Good and Poor Readers' Comprehension." Journal of Reading Behavior 13 (Summer 1981): 45-56.

Third and fifth graders from a rural school were studied. Two groups were formed. The first group consisted of 40 above-average third-grade students and 38 below-average fifth-grade students. The second group contained 20 good third-grade readers and 20 poor fifth-grade readers. Each student read two different expository passages. The first passage was written as a cloze passage, and the students read it silently and wrote in the missing words. The second passage was simply read silently by the students. After each passage was read, the students retold the story to an examiner. The students also retold the story one week later. The results showed that the poor readers could retell more of the stories immediately after reading both passages, and they retold the cloze passages better than the stories that they simply read. One week after reading the passages, the poor readers still remembered more than the good readers, but they did not recall one passage better than the other passage.

The writer concluded that the fifth graders may have scored better because they had more experience with filling in cloze passages and were more familiar with the subjects of the passages.

Dewitz, Peter, Eillen M. Carr, and Judythe P. Patberg. "Effects of Inference Training on Comprehension and Comprehension Monitoring." Reading Research Quarterly 22 (Winter 1987): 99-119.

This study examined 101 fifth graders. For 24 days for 40 minutes each day, the students were taught to comprehend their social studies texts either by the structured overview method, the cloze procedure, a combination of both of the preceding techniques, or a more traditional method of reading and oral discussion. The cloze procedure group and the combination group both scored superior to the other two groups. The researchers believed that the structured overview technique helped the students to see the relationships of different parts of the passages, and that the cloze procedure helped the students to connect their background knowledge to the knowledge of the text. Both literal and inferential comprehension showed greater improvement in the combination group than in the other groups. The authors explained that these techniques probably forced the students to look more deeply for answers to fill in the questions themselves for accuracy. The cloze procedure group was also found to be more aware of the strategy they were using than the other groups.

Sampson, Michael R., William J. Valmont, and Roach Van Allen.
 "The Effects of Instructional Cloze on the Comprehension,
 Vocabulary, and Divergent Production of Third-Grade Students."
Reading Research Quarterly 17 (May 1982): 389-399.

Ninety-two third graders from ten city schools were divided into two groups. The control group was taught to read by a traditional basal program, and the experimental group learned by a traditional basal program along with participation in cloze exercises. The experimental group was taught 27 cloze lessons within 15 weeks. Oral discussion was held after each exercise. The experimental group scored significantly higher in comprehension on both a standardized test and a cloze test.

The writers stated that more research should be done to discover which part of the cloze exercises caused a positive effect on the students' comprehension.

Johns, Jerry L. "An Investigation Using the Cloze Procedure as a Teaching Technique." Paper presented at the Annual Meeting of the National Reading Conference. New Orleans, LA, ED 159 656, Dec. 1977.

Johns compared four groups of fourth graders totaling 222 students. Three of the groups performed cloze exercises. In each groups' cloze passages, different types of words were omitted. For 25 weeks, these students were instructed two times per week with each session lasting 20 minutes. Acceptable answers were discussed after each of the cloze passages was completed in writing. A standardized reading test showed no significant differences in comprehension scores between any of the groups.

Because the author expected to find differences between the groups, he gave several reasons that may have caused there to be no differences between the groups. One of the reasons was that the students became bored half-way through the study. The author ended by stating that he still believed that the cloze procedure was as beneficial as other techniques that taught comprehension and hoped that more research would be done to support his theory.

Grant, Patricia. "The Cloze Procedure for Improving Sixth Grade Students' Reading Comprehension and Understanding of Social Studies Materials." M.A. Thesis. Rutgers University. ED 141 754, Dec. 1976.

Grant investigated the effects of the cloze procedure on sixth-grade students. She divided the students into two groups. Each group contained 21 students. For 1½ hours per week for seven weeks, the experimental group skimmed and read cloze passages from their social studies text, filled in the blanks of the cloze passages, and later discussed their reasons for their answers. The control group read the same stories from the social studies text and answered questions for the same amount of time as the experimental group. To measure the amount of the material that was recalled by the students, the book unit test, a standardized reading test, and a cloze test were given. The results showed that the experimental group comprehended significantly better than the control group.

The author concluded that the experimental group scored better because they focused on details of the text more closely and read more carefully than the control group. She also mentioned that the students showed a lot of enthusiasm about the cloze exercises but suggested that their everyday use would become monotonous.

SUMMARIZING AND OUTLINING

Haynes, Jack E. and H. Thompson Fillmer. "Paraphrasing and Reading Comprehension." Reading World 24 (Oct. 1984): 76-79.

This study examined 315 fourth, fifth, and sixth graders from the same school corporation. Three different tests were administered to each student to measure their paraphrasing abilities along with a standardized comprehension test. A high correlation was found between the students' abilities to paraphrase and their abilities to comprehend reading material.

Although the study showed that the paraphrasing abilities of students could be used to predict the comprehension abilities of students, the authors noted that these results did not necessarily mean that paraphrasing caused students to read with better understanding. However, the authors believed that there was a good possibility that there was a causal relationship and that more research needed to be done to confirm this relationship.

Amuchie, Paul M. "Teaching Summarization Skills to Bilingual Elementary School Children." Paper presented at the Annual Meeting of the California Educational Research Association. Los Angeles, CA, ED 243 332, Nov. 1983.

In this study, 60 fifth and sixth grade bilingual students were divided into three groups. One group was taught to summarize in English, one group in Spanish, and the other group did not have summarization instruction. The two groups that were taught to summarize performed significantly higher on a cloze comprehension test than the group without instruction and significantly higher than their pretest scores.

The author stated that the type of test may have influenced the outcome and felt that other tests should be tried in future studies. He said that the results could also have resulted from the instruction in summarization which helped the students related their schemata to specific parts of the texts.

Bromley, Karen D'Angelo. "Precis Writing and Outlining Enhance Content Learning." The Reading Teacher 38 (Jan. 1985): 406-411.

In her research, D'Angelo examined two groups of low to middle income average ability fifth-grade students. The first group consisted of 26 students, the other group contained 24 students. For one week, the first group learned how to perform the precis writing technique, and the second group was instructed in outlining. During the three weeks that followed the instruction, the first group completed eleven lessons in which they read parts of their social studies book and wrote precis summaries about them. The other group did the same, except they performed an outlining technique. The results showed both techniques to be equally beneficial in aiding the amount of knowledge the students retained. Both of the groups made significant gains in comprehension after completing the lessons. When interviewed, two-thirds of the students said that outlining was more beneficial to their comprehension than the precis writing.

The author suggested that more research be done comparing these two techniques.

Roller, Cathy M. and Robert Schreiner. "The Effects of Narrative and Expository Organization Instruction on Sixth-Grade Children's Comprehension of Expository and Narrative Prose." Reading Psychology 6 (June 1985): 27-42.

A total of 56 above average readers took part in this experiment and were divided into four groups. Two groups were taught to recognize the structure of both expository and narrative texts by finding the main idea and the supporting ideas, writing an outline, and then summarizing the text in writing. The other two groups read expository and narrative passages and found definitions of words in the passages, answered comprehension questions, and wrote summaries. After four days of instruction for 30 minutes each day, the first two groups comprehended better than the second two groups when reading texts that were well organized. On passages that were not well organized, the four groups did not differ in comprehension scores.

The researchers noted that the students in the first two groups may have been looking for the main idea and details in specific locations in the passages.

Doctorow, Marleen, M.C. Wittrock, and Carolyn Marks. "Generative Processes in Reading Comprehension." Journal of Educational Psychology 70 (April 1978): 109-118.

A total of 488 sixth-grade students took part in this study of generative learning. The students were divided into groups. Group One read a story with retrieval clues, Group Two wrote a sentence to tell what happened in the story, Group Three read the story and used a combination of the above two techniques, Group Four read the story without retrieval clues, Group Five read retrieval clues but did not read the story, and Group Six read a different story. Groups One, Two, and Three scored significantly higher on a cloze recall test and a multiple choice comprehension test with Group Three scoring the highest, followed by Group Two, and then Group One. The authors also discovered that the low-ability students had better comprehension when writing a sentence in their own words, and the high-ability students had better recall when reading with retrieval clues.

STUDENT-GENERATED WRITING

MODELING OF OTHERS' WRITING

Braun, Carl and Christine J. Gordon. "Writing Instruction as a Metatextual Aid to Story Schema Applications." Changing Perspectives on Research in Reading/Language Processing and Instruction, 33rd Yearbook of the National Reading Conference. Rochester, NY: National Reading Conference, Inc., 1984. 61-65.

The students used in this study were 54 fifth graders who were above average in reading ability. The study compared two groups. One group learned to write, by modeling the instructor, stories with a narrative structure, and the other group followed the same procedure, only they wrote with a poetry structure. Both groups were instructed for three one hour sessions per week for five weeks. Both groups improved in comprehension when reading narrative texts. On one comprehension test, the groups scored equally well. However, on a standardized test, the narrative group scored significantly higher than the poetry group.

The writers believed that the students' general awareness of the structure of the texts learned through writing helped the students to comprehend any kind of text better. However, because of the discrepancy of the test scores, Braun and Gordon felt that more research needed to be conducted to discover if general text structure awareness is enough to sufficiently increase comprehension, or if students must be taught specifically each type of text structure.

Whitmer, Jean E. "Does Writing Modeled after Children's Picture Books Improve Reading Comprehension?" Paper presented at the Annual Reading Conference of the University of Northern Colorado. Greeley, CO, ED 273 943, Oct. 1986.

Sixty-nine fourth and fifth graders that were at least one year behind grade level, were chosen for the study. They were divided into three groups. The group that wrote stories modeled after children's picture books scored significantly higher in comprehension than the group that modeled picture books on a word processor, and the group that learned isolated comprehension skills.

The author concluded that modeling others' writing does have a positive effect on children's comprehension. Whitmer felt that the short time periods (three thirty minute sessions per week for ten weeks) spent on instruction, and the students' lack of experience on the keyboard of the computer, may have affected the second group's outcome.

SCHEMATA AND DECODING AS FACTORS

Gould, Sandra M., Lester W. Haas, and Jacqueline L. Marino.
 "The Effects of Writing as a Prereading Activity on Delayed
 Recall of Narrative Text." The Elementary School Journal
 86 (Nov. 1985): 199-205.

The researchers believed that the more background knowledge students had about the subject they were reading, the better they would comprehend the material. In their research, Gould, Haas, and Marino wanted to find out if writing was an effective way to expand on students' background knowledge. Thirty fourth-grade students were asked to write about a personal experience, while the other 30 fourth graders were asked to write a story that took place in a setting similar to a story they were going to read. After both groups read the story, they answered comprehension questions about the story. The group of students that wrote in a setting similar to the story they read scored significantly higher on the questions than the group that wrote about a personal experience.

The researchers were impressed by the results. However, they questioned whether the new background knowledge was created by the nature of the assignment, or if old knowledge was simply recalled. They also wondered if oral discussion could have created the same results.

Ferguson, Anne M. and Jo Fairburn. "Language Experience for Problem Solving in Mathematics." The Reading Teacher 38 (Feb. 1985): 504-507.

Ferguson and Fairburn gave many reasons why students have trouble with math word problems. All of these reasons dealt with the difficulty children have with both decoding and comprehending word problems. The authors explained a study done by Botel and Wirtz. Three groups were studied. Each group contained five second graders from remedial math. For an entire school year, one group did word problems from their math texts, one group did no word problems, and one group, with the assistance of their teacher, created their own word problems using the language experience approach. The group that wrote their own problems scored significantly higher than the other two groups on a math application test given at the end of the school year.

The authors felt that by using the language experience approach, the students understood word problems better because they wrote about situations meaningful to them and were actively involved in learning.

Sampson, Michael R., and Others. "Student Authorship and Reading: The Joy of Literacy." Paper presented at the Annual Meeting of the National Reading Conference. Clearwater Beach, FL, ED 236 551, Dec. 1985.

Nine first grade students from a rural Texas school were asked to dictate a story about a fantasy or experience they had. Later, they were asked to read their story and read a story from a preprimer basal reader. The children then retold the stories orally. Despite the fact that the student-authored stories had a readability of a 2.4-4.0 grade level, and the basal reader had only a readability score of 1.8, the students were able to recall more events from their own story than from the basal story.

The authors noted that when the children misread a word in the basal story, the meaning of the text was changed. However, when they read their own stories, a misread word did not cause them to change the meaning of the text. The authors stated that the student-authored stories were more meaningful to the students because they were more emotionally and academically pleasing.

Allen, Jobeth. "Inferential Comprehension: The Effects of Text Source, Decoding Ability, and Mode." Reading Research Quarterly 20 (Fall 1985): 603-615.

Seventy first, second, and third graders read stories they had dictated, stories their classmates had dictated, and stories written by adults. The students were then asked to answer inferential questions about the stories. The students inferred significantly better when reading their own and their peers' stories than when reading the stories written by adults. This outcome took place even though the student-authored stories had higher readability scores than the adult stories. The results also showed that the students comprehended their own stories better than their peers' stories.

Allen concluded that the self-authored texts and the peer-authored texts were more easily decoded by the readers, and thus their comprehension was not interrupted by unknown words. She also stated that the readers' schema was more closely related to their own and their peers' stories than the adult stories. Allen said that more research needed to be done to discover if the readers were inferring or simply recalling from memory their own and their peers' stories.

SUMMARY

Correlation studies have been conducted to research the relationships between reading comprehension and writing in elementary school students. After testing first, second, and third graders for their reading and writing abilities, Heil discovered that the scores of tests that measured the students' writing abilities were good indicators of the students' reading comprehension abilities, especially in the second-grade children. Evanechko, Ollila, and Armstrong found high correlations to exist between the reading comprehension and writing test scores of sixth-grade students as a whole group. However, the researchers said that the scores differed significantly for the individual students. Hughes' study revealed that British children who wrote a great deal more than children from the United States, scored significantly higher on comprehension tests than the United States students. These results were especially interesting since the author noted that the British children did not receive formal reading instruction from a basal reader.

Some studies examined the relationships between reading comprehension and writing as affected by age or academic ability. In a study by Shanahan, he concluded that younger children showed a greater relationship between their ability to spell and their ability to decode words. However, the older elementary school students exhibited more of a connection between their ability to use higher level vocabulary when writing and to write in an organized manner with their reading comprehension. Juel, Griffith, and Gough investigated first and second graders and found that a

low correlation existed between the students' writing performance and their reading comprehension. The authors believed that the results demonstrated that children in the early grades used different thinking processes for reading and writing. Schewe and Froese discovered significant relationships between the comprehension and writing abilities of fourth-grade students. However, the authors noted that the low-ability students had more difficulty completely using their story schema when writing. Chall and Jacobs studied students from low-income families and found their reading and writing scores to be significantly related. Because the authors found that these students fell further behind grade level in reading as they grew older, the authors suggested that these students write more to keep them from falling further behind.

Because of the evidence that has supported a positive relationship between reading comprehension and writing, research has been done to examine specific writing techniques developed for the improvement of reading comprehension. One of these researched techniques is mapping. Studies showed the significant positive effects of mapping on comprehension when compared to other study skills (Berkowitz) and when compared to directed reading lessons from basal readers (Reutzel; Sinatra, Stahl-Gemake, and Berg; Prater and Terry). Berkowitz and Reutzel believed that the students' comprehension benefitted from mapping because they were actively involved in the process, and because it helped the students to learn the structure of the text. Some authors noted that mapping improved comprehension in the students because the students visually related the different parts of the stories

(Reutzel; Sinatra, Stahl-Gemake, and Berg), and because the students related their knowledge to the knowledge learned from the stories (Reutzel; Prater and Terry). Students were found to enjoy mapping activities (Prater and Terry; Sinatra, Stahl-Gemake, and Berg), and Sinatra, Stahl-Gemake, and Berg suggested that some of the positive results of their study could have come from the newness of the activities. One study showed mapping and a basal reader technique to be equally beneficial to students' reading comprehension (Bayne). Bayne believed that her study showed that both of these techniques should be taught to improve comprehension.

Another type of writing exercise used to improve reading comprehension is sentence-combining. Froese and Kurushima found students who combined sentences to have significant improvement of comprehension over students who learned by more traditional methods of instruction. McAfee discovered that fifth-grade students who performed sentence-combining exercises and wrote paragraphs and stories scored significantly higher in comprehension on a standardized reading test than a group who performed their usual language arts activities. Two studies showed differences in outcomes depending on the type of test administered at the end of the study. Neville and Searls stated that two tests that were given at the end of their study measured different areas of comprehension and showed different results. Straw and Schreiner concluded that students did better on a cloze test because it measured the type of thinking they had been taught during the sentence-combining exercises. Eventhough the types of tests used in the above two studies affected the results, the researchers agreed that

sentence-combining was significantly more effective on the students' comprehension than the other methods of instruction examined in the studies. Melvin's research revealed that a skills-based approach to teaching comprehension was equally helpful to students' comprehension. She recommended that sentence-combining be used as a supplement to a skills-based program.

A writing technique that has been employed to test comprehension as well as teach comprehension skills is the cloze procedure. In her investigation, McGee stated that fifth-grade poor readers had better recall of cloze passages than third-grade good readers, and better recall than of non-cloze passages. McGee said that the fifth graders scored better because they had more experience with the cloze technique and the subject of the passage. Dewitz, Carr, and Patberg said that students who practiced the cloze procedure comprehended significantly better than students who practiced the structure overview method or a traditional method, and they were more aware of the strategy they were using. In three studies, oral discussion was held to discuss the answers that the students had written during the cloze procedure (Sampson, Valmont, and Van Allen; Johns; Grant). Two of these three studies showed the cloze procedure as a positive advantage to students' comprehension. It was noted that more research should be done to discover which part of the exercises had a positive effect on comprehension (Sampson, Valmont, Van Allen). The cloze procedure was also found to be beneficial because it caused students to read more carefully and deeply for details, (Dewitz, Carr, and Patberg; Grant), and that it assisted students in relating their background knowledge to the knowledge of the text (Dewitz, Carr, and Patberg). Johns and Grant both warned

that overuse of this technique could become monotonous to students.

Several researchers found summarizing and outlining to be beneficial to elementary school students' comprehension. Haynes and Fillmer discovered a high correlation between the paraphrasing and comprehension abilities of fourth, fifth, and sixth graders. Although they felt that there was a good possibility that paraphrasing would improve students' comprehension, the authors stated that further research should be done to reveal if paraphrasing actually caused students to comprehend better. Amuchie found bilingual students to have improved comprehension after learning to summarize. He believed that the summarization instruction may have caused the students to relate their schema to different parts of the texts. Bromley discovered that fifth-grade students' comprehension benefitted equally well when summarizing and when outlining. Two-thirds of the students from her study felt that outlining was more helpful than summarizing. Roller and Schreiner found that above-average sixth-grade readers who learned and practiced outlining, summarizing, and locating main ideas and supporting details comprehended better than students who learned and practiced finding definitions, answering questions, and summarizing. The first group of readers may have scored better because they knew where to look for the main idea and details in a passage (Roller and Schreiner). Doctorow, Wittrock, and Marks discovered that reading passages with retrieval clues and then writing a summary sentence helped students to improve their comprehension. They said that the lower-ability students gained more from summarizing than the higher-ability students.

The positive effects of writing on comprehension were seen in studies performed in which students generated their own writing. Braun and Gordon and Whitmer observed positive effects on comprehension when fourth and fifth graders wrote their own stories by modeling other authors' stories. The students may have benefitted because they became aware of the structure in which the stories were written (Braun and Gordon). Some authors felt that student-generated writing was beneficial to comprehension because it helped to increase the students' schemata. Gould, Haas, and Marino saw positive results when fourth-grade students wrote stories in a setting similar to a story they were going to read. The authors questioned whether their schemata was increased by the process, or if the information was already known by the students and simply recalled. They also questioned if oral discussion would have caused the same results. Ferguson and Fairburn reasoned that second graders who used the language experience approach to write their own math word problems significantly improved their comprehension of word problems because they wrote about situations that were meaningful to them and were actively involved in the process. In two studies, researchers found that primary grade children comprehended their own dictated stories better than basal stories or stories written by adults (Sampson and Others; Allen). The authors agreed that the students comprehended their own stories better because their comprehension was not interrupted by decoding errors, and the students' schema was more closely related to their own stories than those stories written in the basal readers or by adults. Allen cautioned that the students

may have memorized their own stories.

CONCLUSION

Studies proved that elementary school students' writing abilities and the amount of writing they performed were highly correlated with their reading comprehension performances (Heil; Evanechko, Ollila, and Armstrong; Hughes). Most research confirmed that the highest correlations between reading comprehension and writing were among older elementary school students (Shanahan). Although children with low-abilities had difficulty using all of their schema when writing (Schewe and Froese), it was suggested that writing would keep low-ability students from falling further behind grade level (Chall and Jacobs).

Many types of writing techniques have been developed for the improvement of reading comprehension in elementary school students. Studies on the mapping method showed it to be significantly more beneficial to comprehension than other study skills (Berkowitz) or lessons from basal readers (Reutzel; Sinatra, Stahl-Gemake, and Berg; Prater and Terry). Mapping was effective because it actively involved the students, helped them to learn the structure of the text, related their previous knowledge with the knowledge of the text, helped the students to relate the parts of the story, and was enjoyable to the students. Bayne found mapping equally as effective as a basal program.

Most of the research conducted on the sentence-combining method demonstrated that this technique was superior in the improvement of the comprehension of elementary school students over other methods of instruction (Froese and Kurushima; McAfee; Neville and Searls; Straw and Schreiner). Melvin concluded that it

was equally beneficial to skills-based programs.

The cloze procedure was found to be significantly more effective to comprehension than the structural overview method or a more traditional method of instruction for students who had experience with the techniques and practiced it (McGee; Dewitz, Carr, and Patberg). In some of the research, oral discussion could have added to the positive results (Sampson, Valmont, and Van Allen; Johns; Grant). The cloze procedure was found to be effective because it caused students to read more carefully (Dewitz, Carr, and Patberg; Grant) and helped students to relate their previous knowledge to the knowledge of the text.

Both summarizing and outlining were proved to be beneficial to elementary school students' comprehension. Haynes and Fillmer discovered high correlations between students' paraphrasing abilities and their comprehension abilities. It was concluded that summarizing was effective because it helped students to relate their schema to different parts of stories (Amuchie). Bromley stated that summarizing and outlining were equally beneficial to comprehension, but that the students in her study felt that outlining was more helpful. Low-ability students' comprehension showed more improvement from summarizing than high-ability students (Doctorow, Wittrock, and Marks).

Students improved their comprehension when they wrote their own stories. When students modeled their writing after others' writing, their comprehension improved. This type of writing may have increased their awareness of the structure of the text (Braun and Gordon; Whitmer). Gould, Haas, and Marino found student-generated

writing to increase students' schemata but wondered if oral discussion would have caused the same results. The language experience approach improved students' comprehension of math word problems (Ferguson and Fairburn). Students comprehended their own dictated stories better than adult-authored or basal stories because their comprehension was not interrupted by decoding mistakes, and their own stories were related better to their schema (Sampson and Others; Allen). It was possible that the students memorized their stories (Allen).

RECOMMENDATIONS

Based on the research presented in this paper, it is recommended that:

1. more research be conducted on writing techniques and comprehension to discover which age and ability level children are benefitted the most.
2. research be conducted to discover the effects of other types of writing such as journal writing, free writing, and the language experience approach.
3. elementary school teachers use mapping exercises as a supplement to their present reading program to add variety to lessons, to help the students to see relationships between the parts of stories visually, and to involve the students more in the lessons.
4. elementary school teachers integrate sentence-combining exercises into their present reading program for variety.
5. elementary school teachers supplement their present reading program with the cloze procedure to help their students read more carefully for details.
6. elementary school teachers have their students summarize and outline some of the material they read.
7. elementary school teachers have their students write stories modeled after others' writing.
8. teachers of younger elementary school students have the children dictate or write their own stories and read them.
9. elementary school teachers have their students write in the classroom as often as possible.

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STUDENT QUALIFICATIONS

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I am working toward a reading endorsement along with my Master's Degree. In the graduate courses I have taken pertaining to reading, I have learned that writing is becoming of increased importance in the teaching of reading. I enjoy having my students write and have them write often. I have used some of the methods presented in this paper. I specifically chose the effects of writing on comprehension as my topic because I find comprehension difficult to teach and to keep interesting by simply using the basal reader. As a result of my research, I feel that I can help my students to comprehend better and make learning to comprehend more enjoyable.